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AUTHOR Butcher, Jude
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ABSTRACT

This study of student teacher development path patterns in the management domain presents five management schema types and examples of different development path patterns. Cross-sectional data were obtained from 102 participants across years 1 to 3 of preservice teacher education and from expert classroom managers. Longitudinal data were obtained from 147 participants who were studied across more than one occasion. The five management schema types identified include: source and controller of events; a belief in order but little knowledge about how to achieve it; commitment to obtain learning, with variability in strategy; a facilitative strategy replacing directiveness; and flexible adaptation of strategies to contexts. The study found that student teachers' development path patterns are nonlinear in direction and variable in pace. Development involved moving towards greater congruence within the schema aspects and knowledge forms, and between schema and behavior. Two case studies illustrate contrasting development path patterns. The case studies focus upon the development of teachers' management schemata and its separation from other domains, the changes in knowledge (declarative and procedural) and its organization and application, and influences on the development of the schemata. An appendix summarizes the schema types as they relate to forms of knowledge and teacher efficacy levels. (JDD)

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TEACHER DEVELOPMENT PATH PATTERNS IN THE MANAGEMENT DOMAIN

Jude Butcher
School of Education,
Australian Catholic University (NSW)

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TEACHER DEVELOPMENT PATH PATTERNS IN THE MANAGEMENT DOMAIN

Introduction

One goal of teacher education is to assist teachers in their development of expertise in the management domain. Research on teacher cognition and teacher education can contribute to the movement of teachers toward expertise more effectively through contributing to the development of a better understanding of the nature of teacher development and the influences that affect this development.

Teachers' developmental paths are the routes teachers take as they bring their actions to more effective states by means of adopting new ways of conceptualising and responding to phenomena. These new ways of conceptualising and responding subsume, at least in the long term, the former ways of conceptualising and responding (*progress from novice toward expert.*) They are paths in that there is movement toward a goal with no assumption that all teachers follow the same route toward that goal. They are developmental in that there are changes in the teachers as they move towards higher levels of development or expertise, though this does not mean that each movement along the path is overtly in the direction of a higher level of development.

Evidence of differences amongst teachers' developmental paths has been found in novice teachers' images of teaching at the beginning of their teacher education courses (Calderhead & Robson, 1991; Conners, Nettle & Placing, 1990; Nettle & Conners, 1991; Hollingsworth, 1989) and at other points in their programs. For example in their initial images (Calderhead & Robson, 1991), one novice emphasised good relationships, an emphasis which in turn influenced her view of classroom management, while another emphasised efficiency and the need to have her classroom and work well organised. From their study of these differences, Calderhead and Robson concluded:

> Clearly, students start their teacher training with different ideas about teaching and about their own professional development. .... Research clearly has much to contribute in identifying the nature and development of student teachers' knowledge, so that those involved in teacher education might become aware of the different routes through pre-service training that students take and the processes governing their direction. (1991, p.7-8)

There is a need to identify different developmental paths amongst teachers and to see what aspects, if any, of these paths are common or invariant across teachers and which aspects reflect differences amongst teachers. There is also a need to explain what is involved in and what influences teachers' movements toward expertise. The nature of teachers' developmental paths will be illustrated here through an analysis of the elements within the paths, differences between teachers' developmental paths, and influences on their paths.

It has been found that teachers differ in the routes they take in their development toward expertise. These differences refer to both variations in starting points and to other points along the path. The case study research in teacher cognition provides examples of how teachers differ in the paths they take in their professional development. In the area of classroom management Hollingsworth (1989) showed that while the majority of novices in her study had an initial belief that management "was synonymous with relating equally with their classroom pupils" only half of these subjects had developed a more balanced approach to management by the end of the 9-month teacher education course. Amongst the latter group of subjects, differences were found in the management approaches adopted at this later stage. For example, while there was a general emphasis on routines amongst these

novices, one adopted a more teacher directed and another a "more student directed" approach to management. These changes suggest that teachers' conceptualisations be studied over wider samples of subjects.

The practicum has been found to contribute to the development of student teachers' abilities to articulate their perspectives about teaching and express them in their teaching. However, Tabachnick and Zeichner (1984) showed how these changes in the student teachers' expressions of their perspectives were not associated with significant substantive changes in the nature of the perspectives themselves. Hence, while there were changes associated with the extent and proceduralisation of their knowledge bases, there were no changes in the overarching principles they brought to their practicum experiences.

Teachers at the same point in their careers may express different perspectives toward management and/or teaching. These differences are to be interpreted within the framework of different developmental paths. Within such a framework commonalities may emerge from an analysis of developmental variables and the relationships between them.

This paper reports upon a study of student teacher development path patterns in the management domain. Five management schema types, which were used for tracing the development path patterns, are presented then examples of four different development path patterns are provided. Implications of this and further research in this area for extending our understanding of teacher development and for teacher education practices are discussed.

Background to the study

The research into teacher development reported here is concerned with teacher development from novice through beginner to expert in the classroom management domain. The purpose of this research was to gain an understanding of the development of teachers' management schemata and the implications of this development for teacher education.

There were two concurrent phases in the research, an intensive and an extensive phase. Intensive phase data were collected from a small group of subjects selected from those also involved in the extensive phase. The extensive phase provided data from a large group of subjects who completed a set of questionnaire tasks and an ordered tree task with written explanation. Cross-sectional data were obtained from 102 participants across Years 1 to 3 of pre-service teacher education and expert classroom managers. Longitudinal data were obtained from 147 participants who were studied across more than one occasion.

Identification and validation of schema types

The grounded theory nature of this study of development and the wide set of variables led to the use of data-derived and conceptually-related sets of characteristics, rather than the use of predetermined conceptually-defined sets, for the tasks of distinguishing groups of subjects across different occasions and constructing schema types. Cluster analysis (Tryon & Bailey, 1970) was used for identifying subject groups with defining variables which had a positive correlation with each other while having a different pattern of correlations from those found within other sets of defining variables. Because of the need to identify schema types which could help investigate schema change over time, the cluster groups were examined for different patterns of distribution of subjects across the four cohorts.

The schema types profiles, presented briefly below, were constructed in the form of detailed reports of the type characteristics with respect to each of the variables and measures used for declarative and procedural forms of knowledge and for schema content, structure and meaning. More general features of the different management schema types which could be substantiated across the different tasks and measures were also included.

Both empirical and conceptual validation of types were used for examining the appropriateness of the schema types for the study of development path patterns. The empirical validation entailed the analysis of both the cross-sectional and longitudinal data sets using the optimal linear discriminant function and then identifying the percentages of the subjects' responses which were classified at high, medium or low probability levels. It also included the analysis of the probable shifts across schema types evident in the responses of those subjects who had a low probability classification to schema types. The conceptual validation entailed the examination of the credibility of the schema types as evidenced through the fruitfulness of the use of the types for analysing schema differences over time, identifying the presence of patterns within the schema differences, and providing conceptual tools for examining schema change processes over time (Eisner, 1991).

Schema types

The key characteristics of each type are presented below. Further detail is provided in two tables summarising schema types and the differences between types (See Appendix Table 2 and Table 3).

Type 1 see themselves as the source and controller of events thus using a directive strategy. The objective varies across forms of knowledge with declarative knowledge being marked by idealistic focus on learning while an orderliness focus tends to take over as knowledge becomes proceduralized. Because of their having few ideas about teaching, the still sparse instructional ideas come to dominate in the management schema causing confusion within the schema expressions across declarative and procedural forms of knowledge. Despite this they see themselves as being moderately effective in producing learning outcomes.

With Type 2 a directive for order approach emerges. Declarative, but not procedural, knowledge about organisation and deviancy becomes extensive and very important, showing a belief in order but with little knowledge about how to achieve it. There is a problem, however, as relationships ideas are also of some importance. Conflict is possible as, say, the wish to be on good terms and be liked interferes with behaviours necessary to obtain order. Consolidation at a Type 2 level requires a resolution of this disequilibrium and an acquisition of procedural knowledge. Efficacy levels are still moderately high suggesting suggesting a confidence level which may be unrealistic and unfounded in practice.

Type 3 is characterised by a clear commitment to obtain learning but with more variability in strategy. Directiveness is favoured more often than facilitative. Teaching/learning becomes congruently very prominent in both the extensive declarative knowledge and the limited procedural knowledge base. Here relationships and, possibly, organisation have become shelved for the time being. Thinking across categories is narrowed so that relationships and organisation ideas have a low prominence but within these constraints it becomes more complex and logically related.

Personal efficacy about teaching outcomes is high and somewhat unrealistic suggesting a rigidity resulting from the move away from Type 2.

The learning goal of Type 4 becomes more pervasive across all knowledge forms and a facilitative strategy replaces directiveness, especially in procedural knowledge. There is a change of ideas. Instructional ideas are very important but relationships and organisation are also prominent so conflict could come from reconciling three prominent categories with each other and with the variability in strategies.

A Type 4 schema is more organised, business-like and practical in its approach to management in concrete situations but the process causes confusion as they try to form general guidelines from their experiences. Confidence in efficacy to achieve outcomes decreases from high to moderate.

The Type 5 schema is remarkable in that there are consistent aims to achieve learning and to nurture group well-being. Strategy and the complexity of thinking are, however, flexibly adapted to contexts. They describe themselves as basically facilitative but do not hesitate to be directive where appropriate.

Management is seen as important but as a means for achieving the main purposes. Across all forms of knowledge there is a richness and extensiveness of ideas and particularly in procedural knowledge they establish and maintain routines wherever possible. Resolution of tension allows a focus away from self and onto the needs and perceptions of learners.

The schema has a logical and hierarchical integrated structure enabling complex and abstract thinking. They are confident about dealing with difficult children and overcoming contextual factors but they are not as confident and possibly more realistic about their efficacy in achieving learning.

Development path patterns

Development path patterns were identified in the longitudinal data for those subjects for whom Tree and Questionnaire data had been gathered on at least three occasions. The salience of particular dimensions (levels, paths, and axes) of the longitudinal data in the description of development path patterns emerged in the construction of data-derived categories as a basis for a theory of development in the management domain. Individual dimensions were analysed initially and then dimensions were combined to provide a more comprehensive and multidimensional view of development as identified in changes in schema types over time.

This multidimensional view attended to both qualitative and quantitative dimensions of development path patterns. It considered the nature and direction of the pattern of schema changes over time, whether the changes incorporated a movement across major qualitative differences in schema types and the resolution or lack of resolution of conflict in schema changes across schema types. The nature and direction of the changes were described in terms of the development paths, schema type levels and the development axes and showed differences in the ways subjects arrived at a particular schema type and whether their movements were towards or away from expertise.

Schema type levels were the set of levels (low, high and very high) across which the movement occurred. The levels indicated the different schema types with Types 1 and 2 being classified as low; Types 3 and 4 as high and Type 5 as very high. The classification of the schema types into the three levels was based upon the differences in schema meaning and structure evident across these three groupings of schema types and the incidence of the different types in the data. Types 3 and 4 were referred to as high levels of schema types because the management approaches expressed in belief statements were more similar than those of Types 1 and 2 to those of the experts (Type 5). Schema type levels were used for

reporting whether teachers stayed at low or high levels or moved across the low-high threshold. While a professional goal is for teachers to be expressing higher level schema types it was expected that there would be movements across the low-high threshold as student teachers addressed particular aspects of their development in the management domain.

Development paths were described according to the series of changes in schema types found across three or more occasions. The changes were identifed as induction (I) showing a change to a higher schema type across at least two occasions, or decline (D) showing a change to a lower schema type over these occasions. A plateau (P) represented no change in schema types across three or more occasions. The induction and decline changes are evident in the development path described as IDI for a subject's responses identified as schema types 1, 2, 1, 2, 3.

Development axis was the general direction of movement in schema types over three or more occasions. The categories of axes identified in the data were analogous to those for development paths, i.e. induction, plateau or decline, but also included induction revisiting, and unstable plateau (See Figures 1 to 5). The analysis of development axes provided for the identification of a general movement in schema type responses while the development path would report any oscillation up and down around the axis. The inclusion of the two further categories, unstable plateau and induction revisiting, allowed a description of qualitative differences in the type and degree of movement within plateau and induction development axes.

Development path patterns provided a two dimensional view of development, across three or more occasions, indicating both the overall direction of the movement (axis) and the level(s) involved in that movement. The levels were classified as very high, high and low but since very high was rare (2 cases) they were collapsed with high. A low-high category was used whenever the movement included both high and low levels of schema types.

Four major categories for the analysis of preservice teachers' development path patterns emerged which allowed the movements in schema types across different occasions to be traced. These categories were:

decline-high/low,
plateau-low,
unstable plateau-low,
induction-low/high.

Figure 1

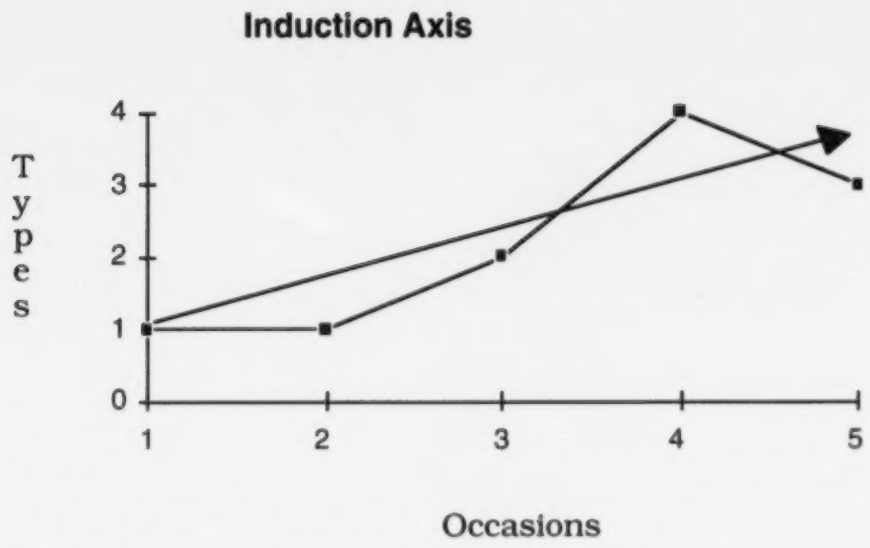


Figure 2

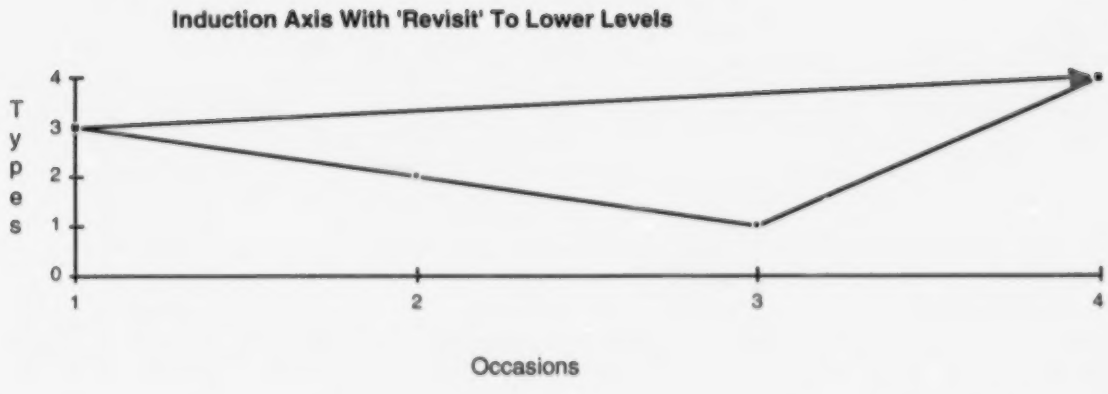
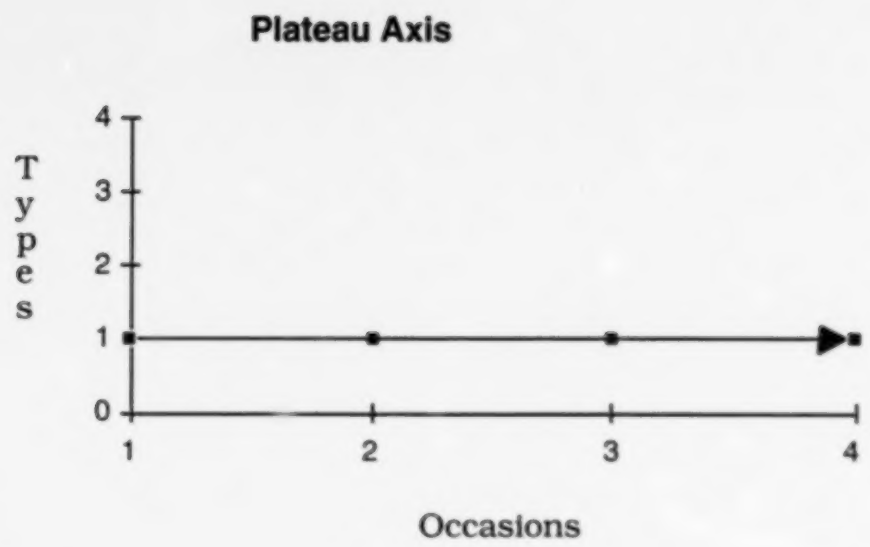


Figure 3



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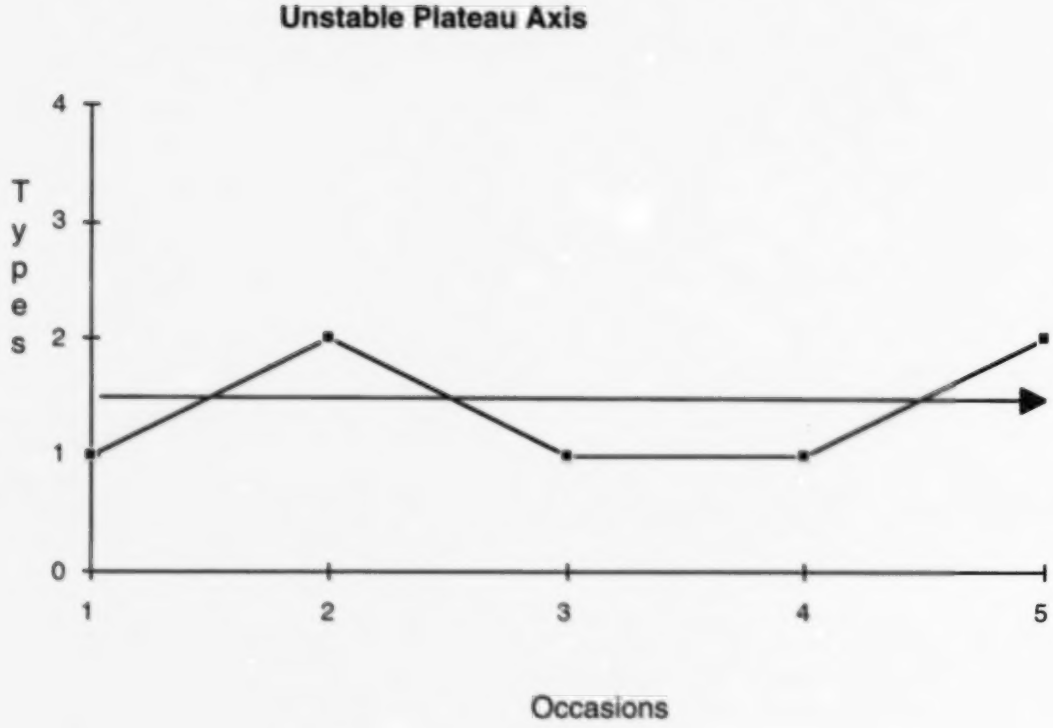

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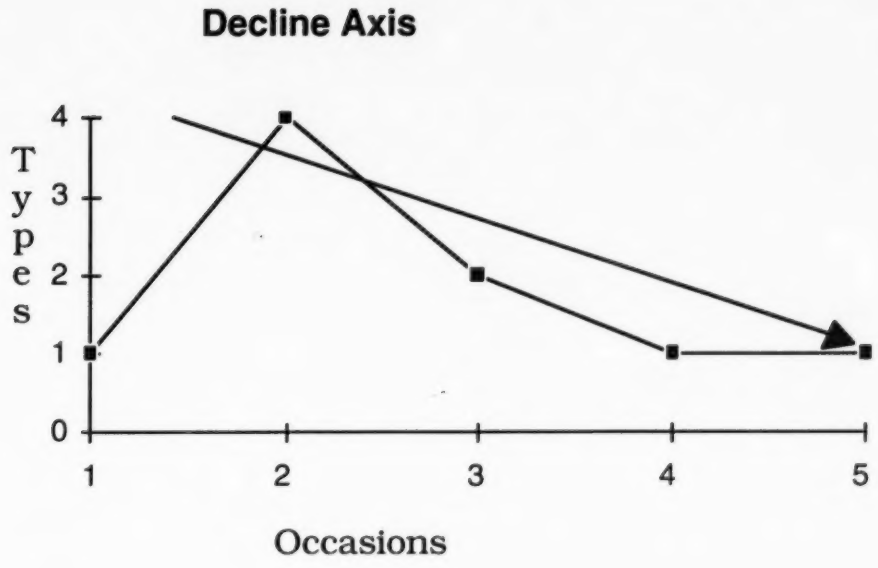

Results

An analysis of the development path patterns showed that 9 of the 16 (56%) participants studied across years 1 and 2 (Table 1 a) and 16 of the 40 (40%) participants studied into year 3 (Table 1 e) stayed at the low level with a plateau-low or unstable plateau-low path pattern. There was a higher incidence (n=9 compared to n=2) of the unstable plateau-low development path pattern amongst participants who were studied across Years 1 to 3 or Years 2 to 3 of their course (n=40) than amongst those who were studied only in the first two years of their course (n=16).

The analysis of the development path patterns showed 26 of the 56 participants crossed the low/high levels with 10 participants reflecting a decline axis and 15 an induction axis. A decline-high/low pattern was found with 2 participants across Years 1 and 2 (13% - Table 1 a) and 6 participants studied into Year 3 (15% - Table 1 e). This decline pattern was slightly more evident across Years two and three of the course (Tables 1 c and d).

Induction patterns were found for 3 of the 16 participants (19%) across years 1 and 2 and for 12 of the 40 participants (30%) studied into year 3 of the course. These patterns were more evident across years 1 to 3 than across years 2 and 3 (See Tables 1 a, b, and c). An induction revisiting-high/low pattern was found with 4 of the total set of 56 participants. This pattern was slightly more evident across year 1 and 2 and years 1 to 3 (Tables 1 a and b) than with those studied only across years 2 and 3 (Tables 1 c and d).

Questions arising from analyses of the development path patterns include:

i) What influenced the development path patterns of those 25 of the 56 participants who stayed at a low schema type level throughout the study?

ii) What contributed to the decline-high/low patterns of those 8 participants who did not move back to the high schema type levels?

iii) What contributed to the induction patterns of the 15 participants who crossed the high-low threshold?

iv) What is the role of the induction revisiting-high/low pattern in teachers' development?

v) What influence do the practicum and its different components have on the development path patterns of participants?

Table 1 Development path patterns (Axis and Level) in longitudinal data

Table 1 (a) Development path patterns - Cohort 1 Y1-2

Levels	Decline	Plateau	Unstable Plateau	Induction	Induction Revisiting	Ambiguous	Total
High							
Low-High	2			2	1	1	6
Low	1	7	2				10
Total	3	7	2	2	1	1	16

Table 1 (b) Development path patterns - Cohort 1 Y1-3

Levels	Decline	Plateau	Unstable Plateau	Induction	Induction Revisiting	Ambiguous	Total
High							
Low-High	1			4	2		7
Low		3	3				6
Total	1	3	3	4	2	0	13

Table 1 (c) Development path patterns - Cohort 1 Y2-3

Levels	Decline	Plateau	Unstable Plateau	Induction	Induction Revisiting	Ambiguous	Total
High							
Low-High	2			1			3
Low	1		2				3
Total	3	0	2	1	0	0	6

Table 1 (d) Development path patterns - Cohort 2 Y2-3

Levels	Decline	Plateau	Unstable Plateau	Induction	Induction Revisiting	Ambiguous	Miscellaneous	Total
High			1					1
Low-High	3			3	1	2	1	10
Low		5	3	1		1		10
Total	3	5	4	4	1	3	1	21

Table 1 (e) Development path patterns-Total participants with Y3 entries

Levels	Decline	Plateau	Unstable Plateau	Induction	Induction Revisiting	Ambiguous	Miscellaneous	Total
High			1					1
Low-High	6			8	3	2	1	20
Low	1	8	8	1		1		19
Total	7	8	9	9	3	3	1	40

Questions arising from analyses of the development path patterns include:

i) What influenced the development path patterns of those 25 of the 56 participants who stayed at a low schema type level throughout the course of the study?

ii) What contributed to the decline-high/low patterns of those 8 participants who did not move back to the high schema type levels?

iii) What contributed to the induction patterns of the 15 participants who crossed the high-low threshold?

iv) What is the role of the induction revisiting-high/low pattern in teachers' development?

v) What influence do the practicum and its different components have on the development path patterns of participants?

Two case studies to illustrate contrasting development path patterns, induction-low/high and unstable plateau-low, and address some of these questions are presented below. The case studies focus upon the development of teachers' management schemata and its separation from other domains, the changes in knowledge (declarative and procedural) and its organisation and application, and influences on the development of the schemata.

Joyce - Reflecting an induction-low/high path pattern

Development and separation of management schema

The case study of Joyce illustrates an inductive pattern of development to type 3 after vacillation between types 1 and 2 over four occasions. Her first responses indicated that declarative knowledge was entirely about teaching-learning and she took a somewhat idealistic view that children should find out through their own research and should be allowed freedom of thought towards a subject. After her first practicum where "some of the kids were hard to control" (Y1 Q2), the need to be firmer in giving instructions, in getting attention and in general control of the class emerged in her principle-based procedural knowledge but her declarative knowledge was still oriented to teaching-learning.

This lag in conceptualising management declaratively from procedural knowledge was not evident eight months later. Even before her practicum in her second year she seemed to have partly separated off management as a separate category within her schema and had recognised that it is necessary for learning and pupil growth. She believed that:

> We must be in control to the extent that children's developmental areas are understood and helped progress in health and care (Y2 Q1).

Her self-description congruently referred to being in control, judging, and using firm disipline. But, at the same time, some disequilibrium could be present as these ideas were not reconciled with her concerns for mutual respect and for the need to know pupils as individuals "before understanding anything about managing them." This idea of understanding individuals accompanied the idea of "ensuring a good classroom atmosphere". The latter concept was qualified by the comment that "one must be careful to the extent that we become involved with the students," suggesting some transition to a more complex and less idealistic concept of relationships.

Changes in knowledge: Its organisation and application

Some development was reported from the primary practicum where "you had to really control them when they would get very excited". Despite being unsure and letting them get

away with a few things in the first week, she reported more consistency in stopping misbehaviour and commented that "in a way I become more relaxed with them but also more stern and firmer with them" (Y2 I1,6-7). After the immediately following secondary practicum she moved to a congruence across all three forms of knowledge. In this practicum she faced a difficult secondary class described as "very disruptive and loud" (Y2 Q2). The outcome was that her declarative knowledge and principle-based procedural knowledge were almost entirely concerned with organisation ideas about consistent expectations, establishing and explaining rules clearly and "having to be on top of them" (Y2 Q2). Script-based vignettes stayed high in the number of action steps suggesting that there is no lack of procedural knowledge, but the tone has changed from being somewhat facilitative to being very directive. Behaviours are demanded rather than being asked for.

Her thinking was, however, clearly being contextualised to the current situation but, in addition, it was being generalised beyond the situation when the reader was cautioned not only to think of every pupil as an individual, but also to evaluate each situation on its own. The recognition of the need for flexibility in approach, together with the attention to group atmosphere, are signs that Joyce has moved into a zone of proximal development where she has consolidated being directive to achieve orderliness and is ready for a further transition in her development. This development was evident in her Year 3 responses.

> If one presents a positive learning environment, they can achieve a security atmosphere for students..... One must set up rules and consequences within the class so that children can establish themselves within the class and know what the teacher and others expect of you (Y3 Q3).

In her advice to beginners she tells them to "be aware of total classroom atmosphere" (Y3 Q3) and in her procedural knowledge responses the primary focus is on the class as a group but individuals are treated facilitatively within this focus.

Influences on development

Probably the major influence on Joyce's development was her own ability to perceive herself as a learner of teaching. In her advice to others in her first year she suggested that they ask questions and experiment with new ideas. She described herself as always willing to learn and when frustration about high noise levels was felt, she outlined three different techniques she tried (Y2 OI,2,10-12). She missed feedback after the primary practicum (Y2 I3,6) and, in summing up after her most difficult practicum, she described it as significant, enjoyable, and "a good learning experience" (Y2 I3,2) from which she had learnt a lot. Her co-operating teachers were perceived as significant influences throughout and they were described as supportive, helpful and providing ideas (Y2 I3,6).

Yet Joyce reserved her right to experiment and amend the ideas and follow through. Especially on the most difficult practicum her needs were being met as the teachers gave positive feed-back, making her feel more confident while at the same time "they've both let me work from my own self and show my own personality, show my teaching, and they haven't restricted it in any way" (Y2 I3,7).

Jacqueline - Reflecting an unstable plateau-low pattern

Development and separation of management schema

An unresolved disequilibrium between the goals of learning and relationships interfered with the development of Jacqueline's management schema. Jacqueline's wish to be liked by pupils and others was a recurring theme in her written responses, in interviews, and in

her classroom behaviour. The result was that she vacillated between Types 1 and 2 for two years. Jacqueline only began to form a distinctive management schema when she revisited the Type Two schema with a controlling directive for order approach during her final practicum experience.

Although recognising after her first practicum that a teacher can be too friendly with pupils, the relationships problems persisted in her declarative knowledge. She was concerned with balancing "discipline and friendliness" (Y1 Q1) and with being "respected as a teacher and as a friend" (Y1 Q2). At the one time she believed that misbehaviour must be prevented to achieve learning goals but, somewhat idealistically, she thought that respect must come before management can be achieved. In the midst of this confused thinking, she described herself as being facilitative for the goal of relationships, "leading and aiding but not ruling or controlling" (Y2 Q3). Jacqueline expected that her learning goals would be achieved through respect for herself as teacher without having to work at achieving order in the classroom first.

She expressed wishes for order so that "even if not co-operative, they (pupils) weren't trying to interfere with my teaching" (Y1 I6,1,5). This was expressed declaratively in her beliefs as a directive strategy which persisted throughout her teacher education. Similarly, in her advice to others she was consistently directive with goals varying between order and relationships.

The expressed directive strategy was, however, contradicted in her classroom actions where she presented facilitative messages to her pupils when correcting off-task and deviancy problems in the classroom. These incidents are explained in interview as "I wouldn't put her down and put a wall between us" and "I didn't want to put her offside" (Y1 I6,1,6). Her beliefs are then best interpreted as expressions of aspiration- I want order for learning- but with the proviso that achieving order must not interfere with good relationships. Tension from this swinging between goals precluded the formation of a set of principles to be carried through into action. The conflict between the wish to achieve good relationships and the wish to achieve order for learning continued throughout four practicums. In an interview reviewing her primary practicum in Year 2 she revealed her confusion.

> You've just got to mix them together with ...them realising that you are friendly but you have to teach them...and it's only going to get done if you have control over them.(Interviewer asks which is the more important?) You've got to have a good relationship to get control so you really have got to have both of them...if they're going to learn....(Bad relationships mean) they're not going to work...if they don't like you (Y2 I1, 5).

The beginning of some resolution probably began shortly after her fourth practicum. She described herself in her role as being directive for learning with no explicit reference to relationships.

> Teacher: role is to teach Manager: be in charge Control: one with power Disciplinarian: one who disciplines students when needed (Y2 Q2).

Tension was still evident, however, in her declarative knowledge where Jacqueline wrote about the need for management and control for learning, while still stating that "management is best achieved when there is mutual respect" (Y2 Q2).

In the following and final year a greater focus on organisation ideas appeared in both declarative knowledge and in advice.

> you must be firm and assertive from the beginning to attain classroom control. You must not only demand but expect your demands to be followed through. Even if it might be time consuming in the beginning eventually it will save time (Y3 Q3).

Moreover, in this final written response, she distinguished between assertiveness and aggression three times- almost as if this was the key which unlocked the management door enabling her to resolve the tension which was blocking her development. In interview she articulated the relating of goals to each other and, in addition, the need to be flexible was recognised.

> I suppose you can relate well to them but still be authoritarian. ... You can say what you expect and .. joke, be friendly with them. But then if they disobey the things that you expect, you've got to set down the rules and carry it out. So I think that comes first before being friendly (Y3 OI,3,6-7).

> Some classes were easier than others. Some you could afford to be ...friendly and relate to, and they accept that because they were the kind of kids they were....Then I had another class who hated me 'cause I was...stricter with them (BT I4,15).

Changes in knowledge: Its organisation and application

The structure of her thinking did not rise above quasi-relational at any stage and, indeed, it moved down in the last questionnaire as she began to add more organisational semes to her schema. Advice was also structured at low or very low levels. Trees were hierarchical in structure and more stable across Year 2 than across Year 1. Relationships was usually the superordinate under which other semes were structured. Until her final year there was differentiation of organisation superordinates only in general, rather synonymous, terms such as control and discipline and almost no differentiation in terms of subordinates such as techniques of eye contact and silences.

Although Jacqueline was observed several times in Year 1, a lack of procedural knowledge was not evident as classes were fairly well behaved and desists were used effectively. Opportunities for pupil misbehaviour were also limited by her narrow range of activities so that her teaching was generally dull and repetitious. A lack of procedural knowledge became clearly evident in the six lessons observed on her fourth practicum with secondary classes. Observation field notes show that uninvolved pupils were not attended to by the teacher. In another lesson disciplinary routines and expectations were not emphasised so control had to be established repeatedly. Misbehaviour was obvious, frequent and widespread almost throughout the whole lesson. Follow through and use of a punishment system produced a temporary improvement in control but this did not last. Jacqueline now perceived the formerly deemed co-operative class as the difficult one. She began the sixth lesson by focussing directly on her expectations and warnings about misbehaviour in a strict but not hostile manner and this was effective for most of the lesson.

The lack of procedural knowledge was not evident in her written responses where the number and type of action steps was adequate. There was, however, evidence of late change from a somewhat punitive approach (Y2 Q3) to an approach where directive techniques were used and where there was more emphasis on expectations (Y3 Q2). In addition, Jacqueline commented in her final interview on the "little things...little handy hints..that really helped" referring to what to do with one's eyes and one's voice. This

apparently late awareness of basic presentation of self (BT I4,24) confirmed the earlier lack of procedural knowledge in this area.

In her final practicum Jacqueline was more aware of off-task behaviour and changed from a punitive approach for misbehaviour in her difficult class to a focus upon pupil on-task behaviour. There was also more evidence of organisationally focussed procedural knowledge with her cooperative class including the use of praise for good work, explicit attention to organisational details and expectations which were followed through.

> The development of her management schema was evident across her declarative and procedural knowledge responses as well as in her management behaviour. Jacqueline expressed her own delight at discovering that when she was calm and relaxed and had control of herself, she didn't 'lose them' even when being evaluated (Y3 OI,6,12).

Influences on development

Some explanation of Jacqueline's early vacillation in her development is evident in her expressed attitudes to her co-operating teachers. She saw her own efficacy as varying with different teachers (Y1 I1,7) and the kind of support provided by them as having a lot to do with her success in teaching (Y3 OI,6,19). She believed that she would teach better when before teachers she felt comfortable with but with other teachers she would try to stick to their methods and so would not learn anything. In reviewing her early practicums (BT I4,5) Jacqueline said that practicum is easier if you are left to your own devices and that co-operating teachers often cause more worry than help.

But even where the support was most comfortable, the nature and scope of that support was limited by her to content and methods and she did not seek help with management problems. Her fourth practicum teacher was seen as "great and he was helpful and I felt so relaxed...It was just...like having a friend to help you...rather than having someone looking down on you" (BT I4,6). His suggestions about lesson content and methods were welcomed but his advice about misbehaviour was rarely sought and when given, was then dismissed as unhelpful.

Even on her final practicum she was very upset about negative criticism from one teacher. This became a threat to her self-esteem but, with encouragement, she finally discussed the matter with the teacher. Her other teacher on the same practicum was seen as giving supportive suggestions and was accepted as a model (Y3 OI,3,12). Jacqueline stated that she really liked the way she taught.

> She was .. very strict and serious with them but then towards the end...joke around with them a bit and let them get away with a bit, but then she'd come down on them again if they ... went overboard (Y3 OI,3,12).

The same teacher advised her to emphasise the positive and Jacqueline reported that praising desired behaviour and ignoring deviancy rather than nagging seemed to work (Y3 OI,6,13).

Her concern to avoid negative criticism which could bring about an uncomfortable interpersonal relationship was freely expressed in interviews. At no time was she aware of her own rights and her own role in presenting her opinions in her interaction with teachers. Nor did she realise that she was impeding her own development. Her need for support was also evident in her judgements about schools. She felt assisted by the strict punitive school

policy on her fourth practicum and unsupported by the policy at her final school which was deemed inconsistent (Y3 OI,3,25).

Jacqueline was a very busy person with lots of part-time work and assistance to her family. It was likely that there was little opportunity for reflection upon her practicum experiences. She did, however, provide ample evidence of her awareness that her confidence levels were volatile (Y2 OI,5,2) and of her own feelings about being in the role of practicum student.

> I don't like to feel people are watching and judging me. I can't act normally (Y1 I2,8) (and again) As a student I've not got the power. I've got to ask the teacher first. I'm scared to carry out threats. I feel really mean (Y2 OI,3,2).

Initial nervousness was still felt at the start of the final practicum (Y3 OI,2,4) and she described her general feelings in the final interview (BT I4,32) as not really thinking you had a right to be there . "I mean it's like going to a party and not being wanted...Oh I'll be glad to get through here."

According to her efficacy scale measures, Jacqueline's belief that she had the personal skills to produce learning outcomes increased to quartile 4 in year 2 and stayed there in year 3. Her focus on learning new teaching methods and her failure to confront management problems could account for this high and probably unrealistic personal efficacy score. In her final year her belief that she was efficacious with difficult students declined (quartile 3 to 2). Judging from observational data, an unrealistic level became more realistic as the management schema developed and she moved from a directive for learning to a directive for order belief approach. Her belief that teachers could impact on learning despite contextual factors was generally low until the final measure when it increased (quartiles 2 to 4), possibly influenced by the rise in her personal efficacy and/or her new learning about order.

Jacqueline's feelings of vulnerability could explain the frequent appearance in interviews of defensive coping mechanisms employed to avoid discussion of her management efficacy. Her perceptions and memories of classroom misbehaviour and even of previous practicums were distorted to the point of asserting that there were no problems really in previous practicums (Y3 OI,3,6). Her self-confidence was maintained by refusing to focus on management outcomes or by offering unusual attributions to explain what had happened in lessons. Among other factors, she attributed misbehaviour to the teacher being away (Y2 OI,3,1), to teaching mathematics last lesson of the day (Y2 OI,6,1) and to having to use new group methods (Y3 OI,1,15).

Even where there was a high level of on-task behaviour, this was often attributed out to pupils being more mature so that only a few are disruptive (Y2 OI,4,2) or to classes being 'nice and not being rude to me' (Y2 OI,4,7), When attribution for difficult lessons was made to herself, she spoke as if she had no control over these personal factors, discussing openly her own tiredness and exhaustion, having to rush a lesson to get to a meeting or to her feelings about punishing pupils (Y2 OI,5,2). Attribution to her own lack of procedural knowledge and skills was absent so that a search for help in this area would not have been considered as a possibility.

Stereotyped thinking about pupils and teachers in terms of gender differences could also have interfered with her development. When comparing two single sex schools, she stated:

> That's why I like teaching boys more than girls.... you just feel so much more at ease - with girls if you just pick one...you'd be picking on her and

> you know, it's just not fair....But with the boys they don't hold it against you (Y2 OI,2,2).

She emphasised the value of having "Masters" (male teachers with added role authority) and of being in a school where you "know the hierarchy, they (pupils) know what's expected of them and what's going to happen" and described the management of her co-operating teacher who recommended lines and extra homework saying: "you've just got to give them lots ... when they misbehave, that's what will make them behave next lesson" (Y2 OI,2,4). She could be seeking control vicariously through the actions of another rather than accepting responsibility for facing it herself.

Past memories of herself as pupil also figured prominently in her thinking. She described her earlier beliefs as teachers always believing that they were right and she saw them as "Hitlers" so that "if you did one thing out of place or incorrectly then you were in big trouble". She recalled specific personal incidents where she was severely punished by being strapped for unwittingly going through a wrong door (Y1 Q1). At school she misbehaved when she didn't respect a teacher (Y2 Q1).

In describing why she had in one lesson changed a whole class punishment and let off those who had worked well: "I know that when I was at school I felt so undone by... when other kids in the class do that, pull you down like that, (because of their misbehaviour)" (Y2 OI,6,3).

Her most satisfying classroom management experience was of a teacher who made lessons so interesting that there was never any disruptive behaviour. Recalling earlier practicums in her final year where change had begun, she remembered her opinion of authoritarian teachers at school and realised the influence of these past memories on her thinking.

> They're going to think I'm the biggest cow... Because I used to think back when I was in school, and I used to say 'Hate those teachers who are like that', you know, authoritarian. And I used to think, I don't want to be seen as one of them, but now I think that's what you have to be like (Y3 OI,3,9).

Jacqueline's difficulties with developing past type 2 arose from her view of herself as person and her personal history. In situations of being evaluated, she lacked confidence, over-valued good relationships with pupils and teachers and was markedly influenced by memories of herself as pupil. Instead of reflecting on her experiences, she adopted defensive strategies to avoid change and maintain her self-esteem. Development began only in her final year when she communicated with a supportive teacher who provided a model of how to achieve order and still have good relationships with a class.

Conclusion

This study of student teachers' development path patterns shows that their development in the management domain is non-linear in direction and variable in pace. Development involves moving towards greater congruence within the schema aspects and knowledge forms, and between schema and behaviour. Resolution of disequilibrium is an essential part of development. This process may involve short or extended periods of regression to a lower schema type.

The varied patterns of teachers' development paths question the assumption of many teacher educators that development is linear and according to a fixed pattern. The case

studies show how the personal self characteristics of the student teachers as well as the nature of their management schemata have an important role in facilitating or interfering with their development toward management expertise. Further research needs to include and focus upon the intervening variables in student teachers' development. Experiences of both cooperative and difficult classroom management situations are necessary for student teachers' development in this domain. Subsequent studies need to give attention to the role of the cooperative and difficult classroom contexts in development and how the influence of these situations is affected by the student teachers' procedural knowledge, efficacy levels, and their concern with power and relationships. They also need to address questions about how the quality of communication and support from significant others influences development.

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APPENDIX Table 2

Summary of Schema Types for Forms of Knowledge and Teacher Efficacy Levels

Schema Aspect	Type 1	Type 2	Type 3	Type 4	Type 5
Declarative knowledge					
Meaning	Directive strategy often focussed on learning	Directive strategy often focussed on orderliness	Learning goal slightly more often with a directive strategy	Learning goal slightly more often with a directive strategy	Learning goal with nurturant or facilitative strategy and attention to group environment
Content Extent	Small knowledge base.	Extensive knowledge base	Extensive especially in beliefs.	Extensive especially in trees.	Very extensive knowledge base.
Prominent Categories	None.	Organisation and deviancy very important, some focus on relationships.	Teaching/ learning very important	Preactive planning very important, teaching/ learning , relationships and organisation important	Teaching/ learning and relationships very important.
Structure Relating of semes	Listing only	Simple across category relating in a logical system.	Complex relating in a logical system.	Complex relating but not always in a logical system.	Abstract and complex relating in a logical system.
Integration/ differentiation		Integration with some differentiation.	Some integration	High differentation	Very high integration and high differentiation
Principle-based procedural knowledge					
Meaning	Directive strategy often focussed on orderliness	Directive strategy usually focussed on orderliness	Directive strategy usually focussed on learning	Learning goal usually with a directive strategy	Learning goal usually with a facilitative strategy
Content Extent	Small knowledge base.				Very extensive knowledge base
Prominent categories	Some prominence on teaching learning	Organisational very prominent.	Instructional very prominent.		Instructional and relationships prominent.
Structure	Listing of unrelated semes	Listing or simple relating.	Complex relating	Listing of unrelated semes	Complex relating

Schema Aspect	Type 1	Type 2	Type 3	Type 4	Type 5
Script-based procedural knowledge					
Meaning Order and on-task situations	The goal usually matched nature of problem. Directive in order situation but varied across on-task situations.				In simple situations goals were appropriate to problems. In complex on-task situation goal was learning or development with a facilitative strategy.
Complex personal situation	Facilitative strategy with learning or development goal	Facilitative strategy with learning goal		Facilitative strategy with on-task or learning goal	Facilitative strategy almost always with learning goal
Content Action step extent	Lmited number of action steps for all situations.	Extensive steps for simple on-task situation. Limited number of steps for order and personal situations.	Limited action steps for all situations.	Extensive step responses to the on-task situations. Medium to high for order situation. Low for personal situation.	Low action steps for simple situations, High action steps for complex situations.
Structure	Simple listing of steps in procedures.				Simple listing for on-task situations. More complex structure for order and personal situations.

Note. The four vignettes are referred to in this table as simple order situation, simple on-task situation, complex personal situation, complex on-task situation.

Schema Aspect	Type 1	Type 2	Type 3	Type 4	Type 5
Self Description	Directive strategy often focussed on orderliness	Directive strategy often with an order and/or relationships focus	Learning goal usually pursued with a facilitative strategy	Learning goal but with varied strategies	Learning goal most often pursued with a facilitative strategy
Teacher Efficacy	Low contextual and difficult student efficacy, medium individual teaching efficacy.	High contextual, medium difficult student and individual teaching efficacy.	Medium difficult student and high individual teaching efficacy	Medium to high contextual, medium individual teaching efficacy	Medium to high contextual and difficult student efficacy and low individual teaching efficacy.

Schema Aspect	Type 1	Type 2	Type 3	Type 4	Type 5
Congruences *Meaning*	Continued emphasis on a directive strategy in beliefs, advice and self description with goal varying from learning in beliefs to increasing emphasis on order in advice and self descriptions. The orderliness goal was pursued with a directive strategy in the order situation but with the rest a range of approaches was evident. Orderliness and learning emphases were evident in order and on-task goals for three of the vignettes. Responses to the personal situation showed more emphasis on a facilitative strategy for learning or development.	High degree of congruence in approach across declarative and procedural knowledge though self descriptions reflected some addressing of both the order and/or relationships goals. The approaches in the personal problem showed how a situation related to the well being of another pupil was seen as warranting the use of a facilitative strategy designed for pupil learning.	Learning was a strong emphasis. The strategy changed from directive for beliefs and advice to facilitative only in self descriptions. In the vignettes the goals varied from order to on-task behaviour and learning according to the nature of the situation though with the personal situation responses were characterised by the use of a facilitative strategy rather than by a particular goal. Facilitative strategies were also evident in responses to on-task situations.	Approach incorporated a learning goal slightly more often pursued with a directive strategy though the self descriptions were not characterised by a particular strategy. The vignettes showed that goals varied according to the nature of the problem. Again there was less homogeneity on on-task situation strategies. The personal situation responses were characterised by a facilitative strategy regardless of goal.	Learning was the major goal in both beliefs and advice. responses. The strategy varied from emphasis on facilitative and nurturant in beliefs and self descriptions to higher incidence of directive strategy in advice. Approaches to the vignettes showed how these teachers responded to the simple situations directively and appropriately and with some attention to contextual factors. They responded to the complex situations with a learning or development goal and a high use of facilitative strategies.

Schema Aspect	Type 1	Type 2	Type 3	Type 4	Type 5
Content	They showed limited declarative and procedural knowledge bases. Teaching/learning and organisation content categories became more salient in the advice responses though in both the belief and advice responses there was minimal differentiation of categories.	There was a more extensive declarative knowledge base but this was not matched by the procedural knowledge base. Organisation and deviancy were characteristics of their knowledge bases with deviancy received more attention in beliefs and organisation in advice	Extensiveness of knowledge base in beliefs was not matched in tree or the procedural knowledge advice responses. Vignette responses showed more extensive sets of procedures for simple on-task situations and for some order responses as well. There were shifts in salience for teaching/learning and organisation with instructional maintaining high salience across the belief and advice responses.	There was a more extensive knowledge base though the belief statements were less extensive. The extensive declarative knowledge base was not matched within procedural knowledge though responses to the simple vignettes were more extensive than those to the complex situations. High preactive planning and low organisation saliences were characteristic of both belief and advice responses	Extensive declarative and procedural knowledge bases though script based responses showed a use of few action steps in simple situation and more extensive responses to the complex situations. Declarative knowledge base featured relationships, and teaching/learning with people varying in the varying in the emphasis given to organisation within their belief and treer responses. Organisation also had a low salience in the advice responses
Structure	Simple structuring of the knowledge bases within the schema.	Clear integration and differentiation of declarative knowledge within schema but only simple listing of script based procedural knowledge. Advice responses showed no particular structure characteristics for procedural knowledge.	More complex relating of semes in both declarative and principle-based knowledge bases while there was only simple listing of procedures in vignette responses.	More emphasis on differentiation rather than integration within the knowledge bases. There was a complex relating of declarative knowledge base which was not evident in procedural knowledge bases.	Complex relating of knowledge bases which was also evident in their attention to contextual elements in vignette responses where there was less reliance on Proutine responses.

Table 3

Schema differences and inferred schema change processes

Schema Types and Differences	Inferred schema change processes
Types 1 and 2 From: Strongly directive with variability of goal across knowledge forms, knowledge bases are minimal and unrelated. Low teacher efficacy. To: Order goal congruence with category prominence across belief and advice. Extensive DK base with more but simple relating of semes. Some focus on facilitation in script based and on relationships. Medium to high teacher confidence, especially with respect to influence upon different contexts.	The structuring of a management schema pervaded by a concern for orderliness attained by a directive strategy. Declarative (DK) and procedural knowledge (PK) category prominence have been tuned so that there is a high focus on organisation and deviancy bringing approach and content into congruence. Extensive accretion of management ideas evident in DK but not in PBPK. The change processes involved are associated with a simple level of relating of semes. High confidence in ability to offset factors from outside the classroom and some sureness about handling difficult students and obtaining outcomes. A restructuring of efficacy schema to effect congruence with management schema.
Type 2 to Type 3 To: Some variability of strategy with a commitment to a learning goal. Goal congruent with category prominence across belief and advice. Extensive DK base with complex relating of semes. Confident about outcomes but unsure about difficult students.	Reconstruction of schema with goal changed to learning. Category prominence has been tuned as TL and Instructional were all very high in frequency and salience to achieve very narrowly focussed schema possibly at the expense of Relationships and Organisation. Extensive accretion of management ideas evident in DK base. This narrow focussing of schema may have influenced improvement of structure to complex relating in a logical system. Very confident about obtaining learning outcomes, which indicates their commitment to the learning goal of the reconstructed schema
Type 3 to Type 4 To: More variability of strategy with strong focus on learning goals. Extensive DK base with all major categories having high prominence within a complex but more differentiated and looser structure. Change to listing of unrelated semes in advice. More confident in dealing with pupils different situations than in dealing with difficult students or in achieving learning outcomes.	Extensive tuning in transition to a restructuring of schema based upon a facilitative strategy, but the process is incomplete. Change seems to be more evident at the script-based PK level where there is evidence of more use of a facilitative strategy and accretion of action steps. But these script-based changes are only just emerging in DK where there is some tuning of category prominence. Preparation becomes very important, while learning remains important. Relationships and organisation have also become important. Tension could result from an inability to reconcile category importance with a directive strategy. Schema structure could be hindering reconstruction as the increase in procedural semes and DK category prominence are accompanied by increased DK differentiation but not integration. There is also more confidence about handling contextual differences.

Schema Types and Differences	Inferred schema change processes
Type 4 to Type 5 To: Strong focus on learning with a facilitative or nurturant strategy which included attention to the social environment. Extensive knowledge bases with complex relating of semes and procedures. Flexibility in strategy, structure and extensiveness of response when responding to different situations. More confident in dealing with pupils different situations than in dealing with difficult students or in achieving learning outcomes.	Experience and resolution of tension have resulted in a restructuring of schema. DK and self-description are realistically congruent. Category prominence has been tuned for organisation and the importance of group environment has raised relationships to a goal. Flexilibity of other forms of knowledge permits adaptation to situations. Structure is simplified in PBPK and in SBPK the perspective has been tuned to distinguish simple from complex situations and to respond appropriately. All knowledge-forms evidence past accretion with extensive knowledge bases. There is confidence about dealing with difficult children and about factors brought into the classroom but less sureness about getting the desired learning outcomes.